

WO 03/105534

PCT/SE03/00957

13

CLAIMS

1. A rectangular microwave applicator arranged to operate at a predetermined frequency, and comprising a microwave enclosure forming a cavity having first and second transverse dimensions and a longitudinal dimension in the direction of propagation of microwave energy, characterised in that said dimensions are such that a main power-transferring  $TE_{ym_1n}$  mode with a long vertical wavelength is enhanced, and a significant amplitude of a complementary  $TE_{ym_2n}$  mode is created, wherein  $m_1$ ,  $m_2$  and  $n$  are positive odd integers and  $m_2$  and  $n$  are both less or equal to  $m_1-2$ .
2. A microwave applicator according to claim 1, further comprising corrugations or metal rods at the tunnel bottom in order to reduce the action and spread-out of LSM modes created by the  $TE_{ym_1n}$  mode.
3. A microwave applicator according to claim 1, wherein a mode choke is achieved at the horizontal upper and lower planes of the tunnel ends by means of a horizontal elongated quarterwave slot provided in the vertical y-directed sidewalls of the tunnel side, said mode choke being adapted to reduce the microwave leakage in the tunnel openings.
4. A microwave applicator according to claim 1, wherein the main power-transferring mode is a  $TE_{y31}$  mode, and the complementary mode is a  $TE_{y11}$  mode.
5. A microwave applicator according to claim 1, wherein the main power-transferring mode is a  $TE_{y71}$  mode, and the

WO 03/105534

PCT/SE03/00957

14

complementary mode is a TEy31 mode.

6. A microwave applicator according to claim 1, the applicator comprising two parallel feed slots in a top  
5 wall thereof connecting the microwave enclosure to a TE10 waveguide, and a metal post arranged at the waveguide centreline between the slots.

7. A microwave applicator according to claim 6, wherein  
10 width of the waveguide is about 86 mm, and the height of the waveguide is about 20-25 mm.

8. A microwave applicator according to claim 6 or 7, wherein the horizontal dimensions of the metal post are  
15 12 x 20 mm, and the height of said post is about 9-11 mm.

9. A microwave applicator according to claim 1, wherein the first and second dimensions of the cavity are 194x308 mm, and the longitudinal dimension is 140 mm, in  
20 order for the applicator to enhance the main power-transferring TEy31 mode and the complementary TEy11 mode at an operating frequency of 2450 MHz.

10. A microwave applicator according to claim 1, wherein  
25 the first and second dimensions of the cavity are 306x436 mm, and the longitudinal dimension is 140 mm, in order for the applicator to enhance the main power-transferring TEy71 mode and the complementary TEy31 mode at an operating frequency of 2450 MHz.

30